

ENVIRONMENTAL
PROTECTION
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July 16, 1998

Ms. Heather Fairfull
Wells Fargo Trust
Asset Management Division
Trust Real Estate Department
P.O. Box 63939
San Francisco, California 94163

Re: Environmental Investigation Work Plan
490 43rd Street, Oakland, California (Blumert Trust)
ACC Project No. 95-6305-001.01

Dear Ms. Fairfull:

Enclosed please find three copies of the Work Plan for additional site investigation and remediation for 490 43rd Street, Oakland, California. This work is designed to address known concerns of the Alameda County Health Care Services Agency (ACHCSA), Department of Environmental Health. ACC Environmental Consultants, Inc. (ACC), is forwarding a copy of the Work Plan to Ms. Pamela Evans at the ACHCSA for review and approval according to requirements of the Underground Storage Tank Cleanup Fund. ACC would like to schedule work as soon as the plan is approved and finalized.

The work described in this Work Plan is designed to enhance natural bioremediation at the site, document improved groundwater quality, and obtain the data necessary to warrant regulatory site closure by April 1999.

If you have any questions regarding the Work Plan, please contact me at (510) 638-8400.

Sincerely,



David DeMent, RG
Senior Geologist

cc. Mr. Kenneth Cheitlin, McShane, Schnack & Cheitlin
Ms. Pamela Evans, ACHCSA

Enclosure



WORK PLAN

July 16, 1998

490 43rd Street
Oakland, California

Prepared For:
Wells Fargo Trust

ACC Project No. 95-6305-001.01

OAKLAND ▪ SACRAMENTO
SEATTLE ▪ LOS ANGELES

**WORK PLAN
ADDITIONAL SITE INVESTIGATION AND REMEDIATION**

**490 43RD STREET
OAKLAND, CALIFORNIA**

ACC Project No. 95-6305-001.01

Prepared for:

Ms. Heather Fairfull
Wells Fargo Trust
P.O. Box 63939
San Francisco, California 94163

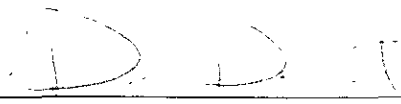
July 16, 1998

Prepared by:



Stephen Southern, REA
Senior Environmental Assessor

Reviewed by:



David R. DeMent, RG
Senior Geologist

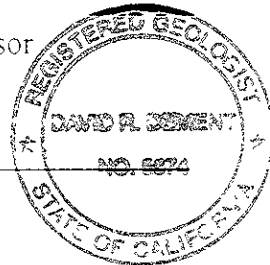


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WORK PLAN
ADDITIONAL SITE INVESTIGATION AND REMEDIATION
490 43RD STREET, OAKLAND, CALIFORNIA

1.0 INTRODUCTION

This Work Plan has been prepared by ACC Environmental Consultants, Inc. (ACC) at the request of Wells Fargo Bank on behalf of the Blumert Trust, for work to be performed at the site located at 490 43rd Street, Oakland, California (Figure 1). This Work Plan was prepared to address a request of the Alameda County Health Care Services Agency (ACHCSA) for additional site investigation and delineation of impacted groundwater. The Work Plan includes protocols for soil sampling in borings and collection of groundwater samples in borings and monitoring wells.

2.0 BACKGROUND

The site is located at the northeastern corner of Telegraph Avenue and 43rd Street, Oakland, California (Figure 2). The property is relatively flat, at an elevation of approximately 90 feet above mean sea level (MSL). The predominant groundwater flow direction is to the south-southwest.

The facility formerly operated one 1,000-gallon gasoline underground storage tank (UST) and one 350-gallon mineral spirit UST, which were removed on December 11, 1991 (Figure 2). Laboratory analysis of soil samples collected underneath the gasoline UST indicated concentrations up to 220 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPHg) and minor concentrations of benzene, toluene, ethylbenzene, and total xylenes (BTEX). Laboratory analysis of soil samples collected underneath the mineral spirit UST indicated concentrations up to 25 ppm mineral spirits. Groundwater was observed in the excavation at a depth of approximately 12.5 feet below ground surface (bgs). The tank pit, which formerly contained both USTs, was overexcavated on March 31, 1992, to remove additional impacted soil. Laboratory analysis of soil samples collected from excavation sidewalls indicated concentrations up to 720 ppm TPHg, 30 ppm BTEX constituents, and 190 ppm mineral spirits.

Three groundwater monitoring wells were installed on April 12, 1993, by Kaprealian Engineering, Inc., (KEI) and have been monitored periodically since installation. Gradient was calculated at approximately 0.01 foot/foot and flow direction has consistently been to the south-southwest. Groundwater samples collected from the monitoring wells indicated elevated TPHg and mineral spirit concentrations.

On June 1, 1994, KEI drilled exploratory soil borings EB1 and EB2. Concentrations of TPHg and mineral spirits ranging from 28 to 180 ppm were detected in soil samples collected from boring EB2 at depths of 10 and 12 feet bgs. Grab groundwater samples collected from borings EB1 and EB2 indicated concentrations of TPHg at 3,400 parts per billion (ppb) and 9,200 ppb, respectively, and mineral spirits at 7,000 ppb and 3,700 ppb, respectively. Sieve analysis of saturated soil at the site determined that the soil is classified as silty sand (SM)

To further evaluate the extent of hydrocarbon impact to soil and groundwater, ACC performed an exploratory boring investigation in April 1996. ACC drilled two exploratory soil borings (SB1 and SB2) to characterize soil conditions in the immediate vicinity of the former tank excavation and six additional exploratory borings (B3 through B8) upgradient and downgradient of the former USTs to characterize groundwater in the general vicinity of the former tank excavation. Concentrations of mineral spirits were detected in sample SB1-9.0 at 52 ppm and in sample SB2-9.0 at 78 ppm. Grab groundwater samples were collected from borings B3 through B8 and analyzed for TPHg, BTEX, and mineral spirits. Concentrations of TPHg ranged from nondetectable in samples collected from borings B3 and B8 to 46,000 ppb in boring B6. Concentrations of mineral spirits ranged from nondetectable in samples collected from borings B3 and B8 to 16,000 ppb in boring B7.

Petroleum hydrocarbon impacts to shallow groundwater were not fully delineated, but concentrations of TPHg and mineral spirits appeared to have migrated preferentially along utility trench lines. Field observations indicated general aquifer quality to be poor, and subsurface groundwater migration is believed to be minimal based on soil type, flat hydraulic gradient, and minimal surface water infiltration.

In a letter to Wells Fargo Bank dated October 17, 1996, ACHCSA approved biannual groundwater monitoring, the installation of one additional monitoring well, and evaluation of options to artificially introduce dissolved oxygen (DO) into shallow groundwater to assist natural bioremediation processes. Agreement on the well location and method of introducing DO into groundwater has not been made between ACHCSA and ACC. Biannual groundwater monitoring and sampling has been conducted since December 1996.

3.0 DISCUSSION

Monitoring wells MW-1 through MW-3 have been periodically monitored since April 1993. Since May 1996, there has been a strong correlation between groundwater elevation changes and changes in concentrations of gasoline and mineral spirit constituents in groundwater. This correlation is normally observed at sites with similar hydrogeological conditions and a residual source of petroleum hydrocarbons in soil. Apparently, residual petroleum hydrocarbons exist in soil located under the existing building that was not removed during UST removal.

Subsurface site investigation performed downgradient of the USTs revealed varying concentrations of the constituents of concern. These concentrations were more indicative of preferential migration along utility pathways than typical diffusion-driven migration in the confirmed groundwater flow direction. Historical groundwater analytical results indicate seasonal fluctuations and generally decreasing concentrations of the constituents of concern. These decreases indicate that natural biodegradation processes are occurring. Natural attenuation processes typically limit any downgradient migration of petroleum hydrocarbons and preferentially degrade short-chain or "light-end" petroleum hydrocarbons. Natural bioremediation processes in effect at the site can be assisted by enhancing DO levels by introducing oxygen releasing compound (ORC²).

4.0 PROPOSED SCOPE OF WORK

4.1 Confirm Dissolved Oxygen Levels

Groundwater samples from each monitoring well have been analyzed for DO, pH, specific conductance, turbidity, salinity, and temperature in the field using a portable Horiba U-10[®] meter and continuous flow cell. Immediately prior to introducing ORC[®], groundwater samples will be collected from existing monitoring wells MW-1 through MW-3 and carefully evaluated for their respective DO concentrations.

4.2 Introduce Oxygen Releasing Compound (ORC[®])

ACC believes that natural bioremediation is occurring at the site and the process could be enhanced by introducing supplemental DO into groundwater. The existing groundwater monitoring wells could be utilized to introduce DO into groundwater using ORC[®] socks. ORC[®] socks are manufactured by Regensis Bioremediation Products, San Diego, California, specifically for use in existing monitoring wells. Typically, DO concentrations in a treated well increase to 10 to 20 ppm, which contrasts sharply with previously measured DO levels in the wells of 1 to 4 ppm.

ACC proposes to install a 1.5-inch-diameter column of ORC[®] in the saturated zone in monitoring wells MW-1 and MW-3. The ORC[®] dissolves and continually releases DO into the groundwater for approximately 9 to 12 months under typical conditions. The ORC[®] raises the pH of the water in the well to approximately 10 pH units, which effectively prohibits bacterial growth in the well. Due to the proximity of three monitoring wells, it may be possible to evaluate the effectiveness of ORC[®] in reducing petroleum hydrocarbon concentrations by sampling and monitoring well MW-2. DO concentrations will be monitored and documented in all three monitoring wells.

4.3 Soil Borings

Excavation and drilling permits will be obtained from the ACHCSA and City of Oakland before drilling and sampling activities. The locations of the proposed borings will be marked with white paint. Underground Service Alert will be notified at least 48 hours before commencing work.

Ten borings will be drilled using a Geoprobe[®], 2-inch-diameter, hydraulically driven sampling probe operated under the supervision of a C-57 licensed contractor. A soil sample will be collected in each boring at the capillary fringe. The borings will be located approximately 16 to 25 feet apart in locations estimated to be in areas of impacted groundwater or useful in retarding offsite migration of any dissolved-phase constituents of concern. Proposed boring locations for ORC[®] injection are illustrated on Figure 2.

Following collection of each soil sample from the capillary fringe, the Geoprobe[®] will be driven approximately 6 to 7 feet into the saturated zone. An ACC geologist will observe as each sampling probe is advanced. Boring and drilling protocols will be followed during field activities.

During drilling, undisturbed soil samples may be obtained for geotechnical classification at five-foot intervals, distinct lithologic changes, and at the soil/groundwater interface. Sampling will begin at a depth of approximately 8.5 feet bgs. An ACC geologist will observe drilling, identify the subsurface materials in the borings using visual and manual methods, and classify the materials as drilling progresses according to the Unified Soil Classification System. This work will be performed under the supervision of a California Registered Geologist. The hydraulic Geoprobe[®] work will be conducted in one day and no drill cuttings will be generated during this work.

After completion of drilling, an ORC[®] and water mixture grout consisting of 20 pounds of ORC[®] to 3 gallons of water will be injected into each boring at approximately 0.5 gallon of ORC[®] grout per one foot of boring while removing the probes. ORC[®] consists of magnesium peroxide that will slowly release dissolved oxygen into the groundwater zone for approximately 9 to 12 months.

The ORC[®] grout will be injected into each boring at depths from approximately the soil/groundwater interface to approximately 7 feet into the saturated zone. After installation of the ORC[®] grout, the lines and probes will be flushed with approximately 3 to 4 gallons of water to clean the probes, maximize the ORC[®] grout placed in each boring location, and help disseminate the ORC[®] in the vicinity of the boring. Portland cement grout will be introduced into each boring above the ORC[®] to complete each boring to just below the surface. The surface of each probe location will be completed with concrete or asphalt to grade to match the surrounding material.

4.3.1 Sample Collection Borings

Four of the borings will be drilled specifically to collect soil and grab groundwater samples to characterize current soil and groundwater along 43rd Street beyond the extent of the monitoring wells. The attached Figure 2 illustrates the proposed sample collection boring locations. Actual boring locations may vary slightly based on field observations, utilities, or unknown physical constraints. Boring and drilling protocol during field activities will follow California State Water Quality Control Board and local guidelines.

One soil sample from each of the four sample collection borings will be logged, characterized, sealed with Teflon sheeting, capped, labeled, and placed in an insulated, pre-chilled container. A minimum of one soil and one grab groundwater sample (if groundwater is encountered) from each boring will be submitted to a state-certified analytical testing laboratory following chain of custody for analysis of TPHg and BTEX, and methyl tertiary butyl ether (MTBE) by EPA Method 5030.8015 '8020 and TPH as mineral spirits by EPA Method 3510-8015M. This data will be used for site characterization and risk assessment purposes.

During drilling, undisturbed soil samples will be obtained for chemical analyses and geotechnical classification in two-foot intervals above and into the soil/groundwater interface. Sampling will begin at approximately 10.5 feet bgs or 1.5 feet above groundwater. The anticipated depth of groundwater is 12 feet bgs. After soil sampling is completed, the probe will be advanced to

approximately 15 feet bgs and a grab groundwater sample will be collected from each boring when groundwater is encountered during drilling.

A report summarizing the work performed, results, findings, conclusions, and recommendations will be forwarded to the client and ACHCSA for evaluation. Any disturbed surface will be restored to its prior condition.

4.4 Groundwater Monitoring

Groundwater samples will be collected from existing groundwater monitoring wells and submitted to an analytical laboratory following chain of custody protocol for analysis of TPHg, BTEX, and MTBE by EPA Method 5030/8015/8020 and TPH as mineral spirits by EPA Method 3510/8015M. Well sampling is tentatively scheduled for September and December 1998, and a potential confirmation well sampling may be conducted in April 1999. At this time, quarterly groundwater sampling will be conducted specifically to evaluate the results of ORC[®] introduction and document improving groundwater quality.

Prior to each sampling event, the water level elevations will be measured in all three wells. Each well will be sampled using a new, clean, disposable teflon bailer attached to new, clean string. Sample vials and bottles will be filled to overflowing and sealed so that no air is trapped in the vial or bottle. Once filled, samples shall be inverted and tapped to test for air bubbles. Samples will be contained in EPA approved vials and bottles. Some analyses may require separate sample containers in accordance with EPA methods described in 40 CFR Part 136 and SW-846.

Water samples intended for volatile hydrocarbon analysis will be contained in 40-milliliter VOA vials. Water samples intended for TPH as mineral spirit analysis will be stored in 1-liter amber glass bottles to reduce degradation by sunlight. Preserved sample containers will be utilized if a prolonged holding time (> 5 days) is expected prior to analysis.

Sample containers will be labeled with self-adhesive, pre-printed tags. Labels will contain appropriate information in waterproof ink such as time and date of sampling and site address.

All samples will be stored in pre-chilled insulated containers to be delivered to a state-certified laboratory for appropriate analysis. All purged water will be stored on site in steel, DOT-approved drums. Drums will be labeled as to contents, suspected contaminants, date container filled, expected removal date, company name, contact, and phone number. The drums will be left on site for subsequent disposal at an accepting facility pending receipt of analytical results.

4.5 Risk Assessment

If necessary, a Tier 1 Risk Assessment will be performed for the site. ACC will meet with ACHCSA regarding the Tier 1 evaluation to discuss parameters of risk and evaluate potential receptors. ACC will review existing data (including previous investigations conducted on site.

monitoring reports, analytical data, boring logs, soil lithology, groundwater gradient, and information obtained in work described in this Work Plan) and prepare a working profile for the site for each risk parameter. Chemicals of concern will be determined and toxicity data compiled for each chemical.

The exposure assessment will include researching zoning restrictions and land use information, planning documents, well surveys within 500 feet of the site, and other pertinent information and evaluating exposure routes. A toxicity assessment (including risk level and receptors) will be performed for each chemical of concern and included in the Tier 1 evaluation.

4.6 Confirmation Soil Borings

If groundwater monitoring results are inconclusive, and a Tier 1 risk evaluation is inconclusive, verification borings may be drilled at the exact locations of the four sample collection borings drilled to collect soil and grab groundwater samples during ORC[®] injection work. Grab groundwater samples can be collected, analyzed for the constituents of concern, and analytical results compared to the original grab groundwater analytical results. If confirmation grab groundwater samples are collected, ACC recommends that a minimum of 6 months elapse between sample collections.

5.0 RATIONALE FOR PROPOSED SCOPE OF WORK

ACC has evaluated the results of previous subsurface site investigation and believes that natural bioremediation is the only feasible and cost-effective remedial alternative. Minor concentrations of gasoline constituents and mineral spirits continue to leach into shallow groundwater and are migrating with it. Due to poor aquifer quality, groundwater migration is believed to predominantly follow preferential pathways and a measurable, defined "plume" of impacted groundwater is difficult or impossible to determine. Previous exploratory boring analytical results are anomalous. Existing utilities, a former downgradient UST, and physical structures make conventional subsurface investigation difficult to perform and evaluate.

ACC believes that natural bioremediation processes can be enhanced by introducing DO through the use of ORC[®]. DO concentrations can be directly measured in downgradient well MW-2 and the results of enhanced DO can be evaluated in regards to decreasing TPHg and BTEX concentrations in all three monitoring wells. The proposed locations for the introduction of ORC[®] should maximize the benefit of higher DO levels by their proximity to the original source and by taking advantage of the existing groundwater flow direction. In addition, DO should follow any existing preferential pathways and assist in the further natural degradation of potential dissolved-phase petroleum hydrocarbons to minimize downgradient migration potential. Since the ORC[®] socks placed in wells MW-1 and MW-3 only have a useful life span of approximately 6 to 9 months, the wells can be later used to monitor groundwater quality and confirm the benefits of ORC[®] introduction.

This proposed work is consistent with the guidelines provided in the ASTM document E 1739-95, *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* and natural attenuation guidelines provided in the Environmental Protection Agency document EPA 510-B-94-003, *How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites, A Guide for Corrective Action Plan Reviewers*.

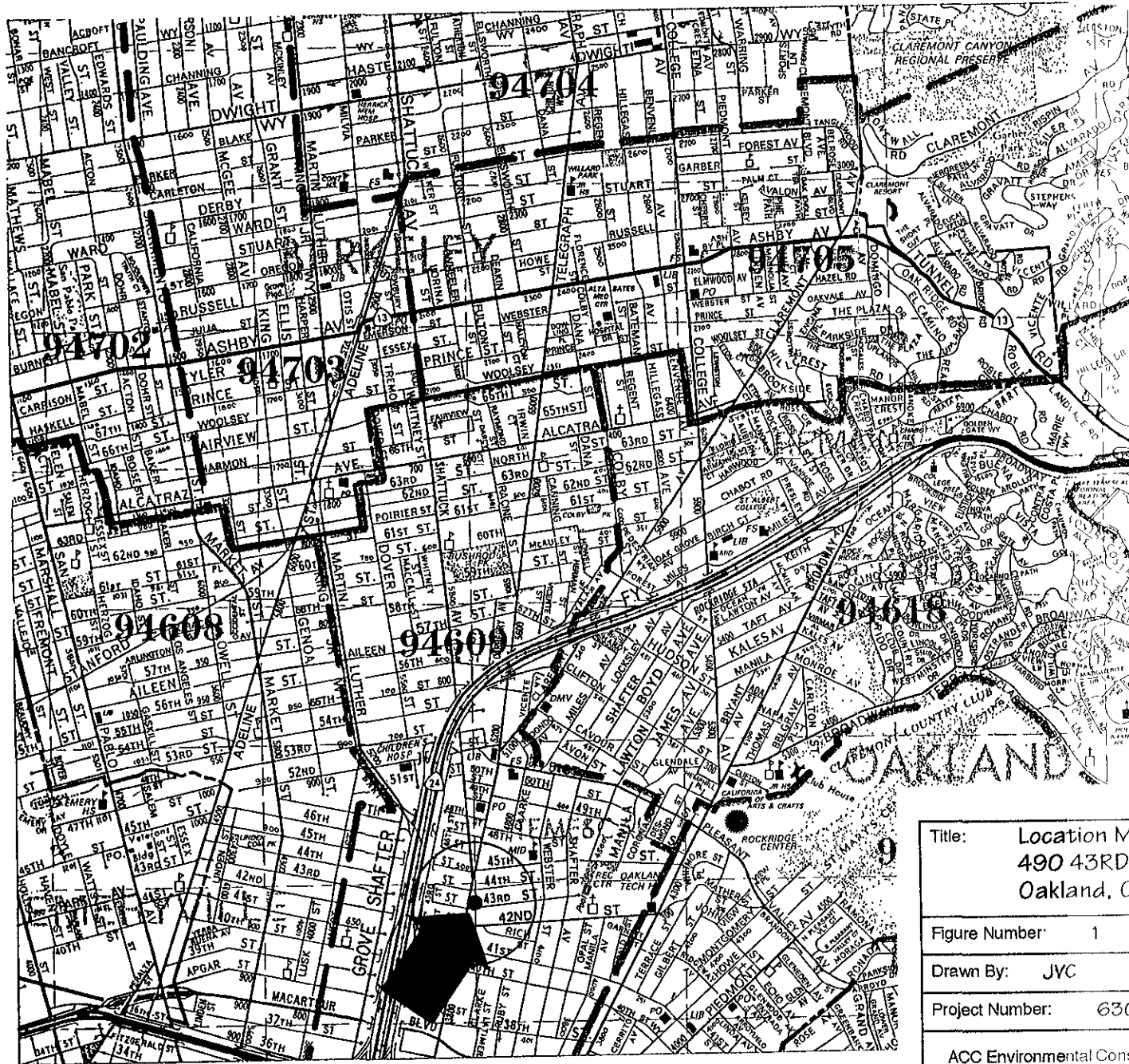
6.0 HEALTH AND SAFETY PLAN

A site-specific Health and Safety Plan which encompasses the proposed work within the area and complies with the requirements of 29 CFR Part 1910.120 will be written. A copy of the Health and Safety Plan will be kept on site during field work operations and will be available for reference by appropriate parties during the work.

7.0 TECHNICAL REPORTS

A technical report discussing the subsurface findings will be submitted to Ms. Heather Fairfull, Wells Fargo Trust, for review and acknowledgement. A copy of the final report will be supplied to Wells Fargo Trust for submission to the ACHCSA under their cover letter. Reports will be reviewed and stamped by an appropriate registered professional.

Groundwater monitoring reports will be submitted after each monitoring well sampling event.



SOURCE: THOMAS BROTHERS GUIDE

Title: Location Map
490 43RD Street
Oakland, California

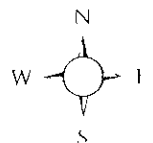
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Drawn By: JVC Date: 12/19/95

Project Number: 6305-1.1

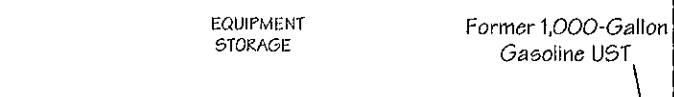
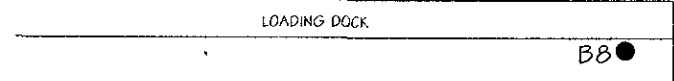
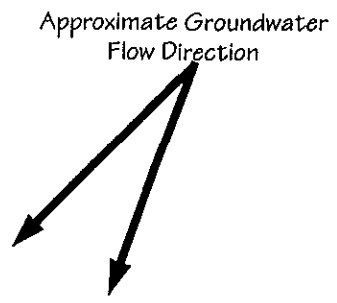
ACC Environmental Consultants
7977 Capwell Drive, Suite 100
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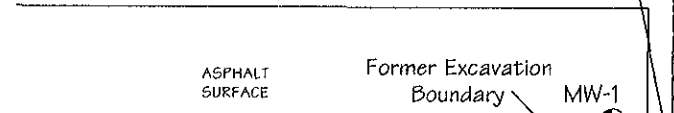


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TELEGRAPH AVENUE



Former 1,000-Gallon Gasoline UST



Former Excavation Boundary

STREET FENCE

Storm Sewer

SIDEWALK

6" Water Line

43RD STREET

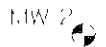
Gas Line

Storm Sewer

Legend



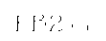
Former 1,000-Gallon Gasoline UST (489 43rd Street)



Existing Groundwater Monitoring Well



ACC Soil Boring Location (April 16, 1996)



Kaprelian Engineering Boring Location



ACC Proposed ORC Boring Location

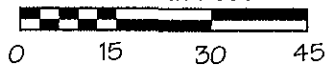


ACC Proposed Boring with soil and grab water sample collection



Former Underground Storage Tank

Scale In Feet



Title: **Site Plan**
490 43rd Street
Oakland, California

Figure Number: **2** Scale: **1" = 30"**

Drawn By: **JVC/DRD** Date: **6/17/98**

Project Number: **6305-001.01**

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